The Relative Effects of Chronological Age on Hispanic Students' School Readiness and Grade 2 Academic Achievement

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This study examined the relations of age, preschool experience, and gender with children's school readiness levels at kindergarten entry. The sample included 5,512 children of predominantly Hispanic heritage and from families experiencing low socioeconomic circumstances. A series of between-subjects ANOVAs indicated that age (Eta² .019 to .043), preschool experience (Eta² .104 to .204), and gender (Eta² .015 to .022) were significantly related to children's school readiness as measured by the Kindergarten Student Entrance Profile (KSEP). Logistic regression examined the unique contribution of these variables to predict students' academic achievement at the end of Grade 2 with a subsample of 980 students. The strongest achievement predictor was school readiness – the odds of students rated in the top 25% on the KSEP having proficient or advanced scores on the English Language Arts portion of the California Standards Test at the end of Grade 2 were 4.51 greater than the odds of students rated in the bottom 75% on the KSEP having proficient or advanced scores. Similar results were found for students' achievement in mathematics. The key findings of this study showed that formal preschool experiences play an important role in preparing children of Hispanic descent and who live in households experiencing low income for kindergarten entry. However, children's readiness at entry into kindergarten was more strongly related to later academic achievement than age at kindergarten entry and preschool experience.

KEYWORDS: school readiness, Kindergarten Student Entrance Profile, age of school entry, academic achievement, Hispanic students, gender

As a child nears five years of age, parents often consider the skills he or she needs to be successful in school. Similarly, schools may use developmental screening assessments to evaluate if entering kindergarteners are prepared to be responsive learners (Saluja, Scott-Little, & Clifford, 2000). In response to these concerns, the California legislature passed a law moving the cutoff date for entry into kindergarten from December 2 to September 1 of the year in which the child turns five years old (Kindergarten Entry Age, CA SB. 1381, 2010). This change in policy was based on the belief that children entering kindergarten before five years of age are too young and that beginning school at an older age would benefit their academic and social development. In most U.S. states, children must be 5 years old by August 31-September 1 to be eligible to enroll in kindergarten, and in some states, the entry date is June 1 (Stipek, 2002). California's policy change is reflective of a number of states changing the school entry date and requiring younger children to wait an additional year before entering kindergarten (Stipek, 2002).

Despite the laudable aims of this educational policy, which is backed by some research evidence (Bisanz, Dunn, & Morrison, 1995; Diamond, 1983; Langer, Kalk, & Searls, 1984; Stipek, 2003; Uphoff & Gilmore, 1985), there is still debate regarding the long-term effects of later entry into kindergarten,

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particularly for students who come from disadvantaged socioeconomic backgrounds (Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007).

Research over the past decade has demonstrated that children's school readiness is related to a variety of positive school-related outcomes (Duncan et al., 2007; Ladd, Herald, & Kochel, 2006; Le, Kirby, Barney, Setodji, & Gershwin, 2006; Quirk, Furlong, Lilles, Felix, & Chin, 2011). However, few studies have specifically examined the combinatorial influences of chronological age, gender, and preschool experience on children's readiness at entry into kindergarten (Gullo & Burton, 1992), and none have examined these issues with at-risk student populations. Thus, the current study examined the unique and interactive effects of age, preschool experience, and gender on children's school readiness at kindergarten entry with a sample of over 5,500 Hispanic children from a predominantly low income, agricultural community in central California. In addition, longitudinal data on a subsample of 980 students were used to explore the relations between these factors and students' performance on high stakes mathematics and English assessments at the end of Grade 2.

Age and School Readiness

Current policies and practices regarding kindergarten eligibility are primarily derived from a maturationist perspective (Snow, 2006). From this perspective, children are viewed as ready for kindergarten entry when they have achieved a certain level of physical and psychological maturity. Therefore, it is often assumed that, in terms of school readiness, older is better (Meisels, 1996; Shepard & Smith, 1986).

Concerns regarding the readiness of children entering kindergarten are not limited to school administrators and policymakers. An increasing number of parents whose children born at or near existing kindergarten cutoff dates are deciding to hold their children back from kindergarten entry (NCES, 1997; Stipek, 2002), a process sometimes referred to as *redshirting* (see Frey, 2005). In addition, teachers often cited age as a significant factor when describing children who struggle in kindergarten (Heaviside & Farris, 1993; NCES, 1993) and reported that they consider age when deciding if a child who is held back in kindergarten will fit well in the subsequent cohort of students (Shepard & Smith, 1986).

Taken together, public sentiment appears to support the notion that older children are more ready for schooling than younger children. Embedded within this assumption is the belief that relatively older children will benefit more from kindergarten instruction than younger children; however, the evidence from research examining this assertion is mixed. Some research evidence indicates that children who enroll in kindergarten at an older age tend to outperform children who enter kindergarten at a younger age on standardized tests during the elementary school years (Carter, 1956; Cascio & Schanzenbach, 2007; Crosser, 1991; Dickinson & Larson, 1963). In addition, Gullo and Barton (1992) found that age, years of preschool experience, and the interaction between age and years of preschool all contributed significantly to children's school readiness at the end of kindergarten. However, they also found that when preschool experience was controlled, the effects of age were not nearly as strong, indicating that age is not as influential for children who have had extensive preschool experiences. Other researchers have found that younger kindergarteners made progress similar to their older peers during the kindergarten year (Loeb et al., 2007; Mayer & Knutson, 1999; Morrison et al., 1997) and that any short-term deficits observed during the early school years tended to dissolve by the end of elementary school (Stipek & Byler, 2001).

Preschool Experience and School Readiness

In contrast to the maturationist model, the constructivist model is based on readiness emerging from children's interactions with skilled peers and adults. The constructivist model is used to support efforts to provide high-quality preschool experiences (Andrews & Slate, 2001). Numerous studies have examined the impact of preschool experiences on various aspects of children's school readiness. For example, beginning childcare at an earlier age has been shown to have a significant positive effect on readiness development of many children (Gullo & Burton, 1992; Howes, 1988). In addition, the positive impact of preschool on academic and social development is particularly strong for children of minority or low-income backgrounds (Connell & Prinz, 2002; Lee, Brooks-Gunn, Schnur, & Liaw, 1991; Loeb et

al., 2007; Turney & Kao, 2009). However, a large scale study by the National Institute of Child Health and Development (NICHD) was conducted to examine the effects of childcare on a number of different developmental outcomes and found no relation between hours of childcare enrollment and cognitive or language skills (NICHD Early Child Care Research Network, 2000). Most of these studies did not examine these relations with large numbers of Hispanic children, or families where English was not the primary language spoken. Hence, more research is needed to better understand the influence of preschool experiences for these populations of children.

Study Purpose

The primary purpose of this study was to examine the relation between chronological age at enrollment into kindergarten with later academic advantages. We tested the hypothesis that age at kindergarten enrollment is positively associated with school readiness and later school outcomes by examining the following research questions:

- 1. Is age at entry to kindergarten related to children's school readiness? To answer this question, we compared the school readiness ratings of children by age and hypothesize that those children born in the winter and spring months (December 2 to April 30) would have significantly higher school readiness ratings than younger children born in the summer and fall months (May to December 1). In addition, we examined the association of age at kindergarten entry with gender and preschool experience, variables that others studies have indicated are associated with an adaptive transition into formal education.
- 2. Do those students who are held out of kindergarten for a year, even when they are eligible by age to enroll, have higher school readiness ratings than typical kindergartners when enrolled? For this analysis, we examined the school readiness ratings of students who were "redshirted" and compared them to the ratings of other children.
- 3. School readiness is just one indicator of a child's possible early educational trajectory; hence, a related important question examined in this study was: Does age at kindergarten entry predict academic achievement at the end of Grade 2? And, if it does, is the effect size larger than those of gender, preschool experience, English language skills, and a measure of school readiness taken at entry to kindergarten?

METHOD

Participants

The students in this study were all enrolled in a K-8 school district located in a community with a population of about 100,000, with a distance of more than 60 miles to another similar-sized population area. District enrollment was more than 12,500. The average class size was 23.2 in kindergarten, 20.8 in Grade 1, and 20.0 in Grade 2. In 2007-2008, 31% of the district's students obtained scores of "proficient" or "advanced" on the California Standards Test (CST) English-Language Arts assessment compared to 46% of similar-aged students throughout California. On the CST mathematics standards assessment, the district's students had scores similar to the statewide averages for similar-aged students (44% versus 43% proficient or advanced, respectively). School enrollment questionnaires completed by parents during kindergarten enrollment indicated that a significant proportion of the children were from families experiencing low socioeconomic circumstances, with 79.2% of the entering kindergarten students receiving free or reduced-price lunch services.

Beginning in 2004, all kindergarten students were assessed with the Kindergarten Student Entrance Profile (KSEP), a universal school readiness instrument administered as a standard school practice in the district. The data for this study included all students with school readiness ratings who entered kindergarten in the fall of 2005, 2006, 2007, and 2009. Table 1 shows the characteristics of each cohort. Across all four cohorts, school readiness ratings were available for 5,512 children. These participating students were exactly 50% boys and 50% girls. The majority of these children were of Hispanic heritage (89.2%), followed by children of White (nonHispanic) (4.1%) and Filipino (1.9%) ethnicities. All remaining ethnicities were less than 1.0% of the sample. As an indicator of language background, the

kindergarten teachers recorded the language the children were observed to use as part of the school readiness assessment. Most of the children used English (46.1%), followed by a combination of English and Spanish (36.7%), and Spanish only (17.2%). Data for one or more of the variables used in the analysis were missing for 1.9% of these cases, which were not included in the analysis.

In addition, the 2006 cohort included 980 children who were rated with the KSEP at Kindergarten entry and for whom Grade 2 CST scores were available. This subgroup was comprised of 47.9% boys and 52.1% girls; 91.6% of whom were of Hispanic heritage. Data for this subgroup of students were used to examine the relations between school readiness at kindergarten entry and later academic achievement.

Measures

School readiness. The Kindergarten Student Entrance Profile (KSEP; Santa Maria–Bonita School District, First 5 of Santa Barbara County, and University of California Santa Barbara, 2005) is a universal screening measure of students' school readiness. The KSEP is an observational rating scale completed by teachers after they observe a child for three weeks in the natural classroom environment. All district kindergarten teachers completed a two-hour training session focused on procedures for administering and scoring the KSEP. This training explained the KSEP rubric, which provides operational definitions for each KSEP item (see Lilles et al. [2009] and Quirk et al. [2011] for detailed information about the KSEP).

Table 1 Estimated Marginal Mean Kindergarten Student Entrance Profile Ratings Across Four Cohorts of Kindergartners by Gender, Season of Child's Birth, and Child's Preschool Experience

Study variables	Kindergarten Cohort												
	August 2005			August 2006			August 2007			August 2009			
	N	М	SE	Ν	М	SE	N	М	SE	Ν	М	SE	
Gender													
Male	519	50.08	0.47	637	47.79	0.42	708	48.15	0.40	838	48.16	0.31	
Female	509	52.64	0.45	680	51.31	0.39	697	51.01	0.38	821	50.84	0.32	
Age at Grade K entry ^a													
Winter (oldest)	253	53.06	0.69	351	51.86	0.58	362	51.97	0.54	395	51.89	0.44	
Spring	259	52.23	0.65	335	50.76	0.56	337	51.16	0.57	410	50.42	0.45	
Summer	278	50.95	0.62	313	49.08	0.58	354	48.73	0.54	422	48.84	0.44	
Fall (youngest)	238	42.20	0.65	318	46.50	0.58	352	46.46	0.56	432	46.85	0.44	
Preschool experience													
Head Start	151	56.94	0.70	201	52.93	0.63	227	54.45	0.60	281	53.71	0.51	
State preschool	183	53.50	0.63	278	51.08	0.53	262	51.36	0.55	397	53.39	0.43	
Summer camp	108	48.49	0.83	154	48.67	0.73	193	46.57	0.67	325	46.75	0.48	
No known preschool	586	46.11	0.35	684	45.51	0.34	723	45.93	0.33	656	44.15	0.33	
Mean KSEP Score	1,028	49.32	9.49 b	1,317	48.31	9.65 b	1,405	48.34	9.90 b	1,659	48.43	9.80 b	

Note. See Table 2 for analysis of variance results. Denotes time of year when child was born: winter (December, January, February), spring (March, April, May), summer (June, July, August), and fall (September, October, November). Set and deviation

California Standards Test (CST). The CST is used to monitor student academic progress from Grades 2-12. The Grade 2 English-Language Arts (E-LA) portion of the exam contains 65 items matched to the California's curriculum blueprint by multiple independent item review teams covering the areas of word analysis, reading comprehension, literary response and analysis, writing strategies, and written conventions. The Grade 2 mathematics portion of the exam has 64 items covering the content areas of number sense, algebra functions, measurement and geometry, statistics, data analysis, and probability.

The internal consistency coefficient for both E-LA and mathematics in the 2008 administration was .93 for Hispanic second graders (California Department of Education Standards an Assessment Division, 2009). Both the E-LA and mathematics scores produce a standard score that is then expressed as one of five general performance levels: far below basic, below basic, basic, proficient, and advanced. The desired level of achievement is proficient or advanced. For the 2008 statewide administration, it was estimated that 92% of the Grade 2 students who scored as proficient or advanced in E-LA and mathematics were correctly classified (California Department of Education Standards an Assessment Division, 2009).

Procedures

The district school readiness kindergarten transition coordinator trained all teachers on the use of the KSEP prior to the beginning of each school year. KSEP ratings were recorded for each student on a standard form and scores were recorded in an Excel database with an associated student identifier (state assigned identification number). All data were collected by the district as part of general education practices and shared with researchers as part of a collaborative effort to better understand the psychometric properties of the district-developed KSEP and to better determine the readiness of students at school entry. California education law encourages school districts and universities to collaborate on data sharing for research purposes. The database used for this study was stripped of any unique student identifiers, per the requirements of the university's institutional review board.

Analysis Plan

To address the first research question, the associations between kindergarten readiness and gender, age, and preschool experience and their possible interaction, four separate 2 (boy vs. girl) x 4 (winter, spring, summer, fall birth) x 4 (Head Start, state preschool, summer orientation camp, and no known preschool) between-subjects analyses of variance (ANOVA) were conducted. Tukey's post-hoc comparisons were used to examine group differences for significant main and interaction effects. Using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) for the design and analyses used in this study (setting the apriori effect size to .25, *p*-level to .05, power to .90, and for 32 total subgroups), a sample of 400 was needed for each of the four cohorts included in the analysis; hence, the sample size for these analyses was sufficient. Each of these four ANOVAs is an independent replication of the analysis with a unique sample. In addition, to synthesize the results across all four cohorts, we combined the cohorts and ran another 4 (age: season of birth) x 4 (preschool experience) ANOVA with KSEP school readiness ratings as the dependent variable. Because this was a second analysis using the same samples, we adjusted the *p*-level to .025 for all ANOVAs.

Another planned analysis examined the relative contributions of gender, age at Grade K entry (season of birth), preschool experience, KSEP language of response, and kindergarten readiness to predict Grade 2 academic achievement. For this analysis, we used logistic regression. The predictor variables were all recoded to be binary in the following fashion: gender (0 = male, 1 = female); age at Grade K entry (season of birth: 0 = summer/fall birth, 1 = winter/spring birth); preschool experience (0 = no known preschool/summer orientation camp, 1 = Head Start/state preschool); KSEP language of response (0 = Spanish/English–Spanish, 1 = English), and school readiness (0 = KSEP percentile rank of 1-74, 1 = KSEP percentile rating of 75-99). The dependent variables for these two analyses were the Grade 2 CST English-Language Arts and Mathematics scores (0 = far below basic/below basic/basic, 1 = proficient/advanced). Using G*Power 3 (Faul et al., 2007) for this design and analysis (setting the apriori effect size to .10, *p*-level to .05, power to .90) with 4 predictors variables, a sample of 159 was needed; hence the sample size for these analyses was sufficient.

RESULTS

Variables Associated with School Readiness

Tables 1 (means and standard deviations) and 2 (ANOVA statistics) show the results of the 2 (gender: boy vs. girl) x 4 (season of birth: winter, spring, summer, fall) x 4 (preschool: Head Start, state preschool, summer orientation camp, and no known preschool) between-subjects analysis of variance for each of the four cohorts. The same pattern of results was replicated across all four cohorts. For each cohort, the main effects for gender (small effect size = Eta^2 .015 to .022), season of birth (small effect size = Eta^2 .019 to .043), and preschool experience (medium to large effect size = Eta^2 .104 to .204) were all significant. All two- and the three-way interaction terms were nonsignificant.

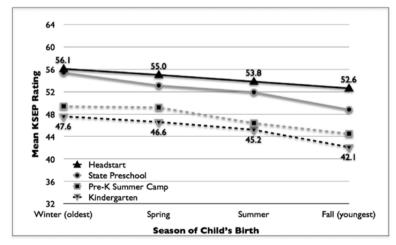
Table 2 Univariate Analysis of Variance Results for the Kindergarten Student Entrance Profile Ratings Across Four Cohorts of Kindergartners by Gender, Season of Child's Birth (Chronological Age), and Child's Preschool Experience

	Kindergarten Entry															
	August 2005				August 2006				August 2007				August 2009			
Study variables	F	df	р	Eta2	F	df	р	Eta2	F	df	р	Eta2	F	df	р	Eta2
Gender	15.51	1, 996	< .001	.015	37.35	1, 1285	< .001	.028	26.91	1, 1373	< .001	.019	36.71	1, 1627	< .001	.022
Age at Grade K entry ^a	6.45	3, 996	< .001	.019	16.29	3, 1285	< .001	.037	20.31	3, 1373	< .001	.043	23.93	3, 1627	< .001	.042
Preschool experience	82.36	3,996	< .001	.199	49.67	3, 1285	< .001	.104	65.14	3, 1373	< .001	.125	139.40	3, 1627	< .001	.204

Note. See Table 1 for study variable mean values. ^a Denotes month child was born: winter (December, January, February), spring (March, April, May), summer (June, July, August), and fall (September, October, November).

To summarize these results, another 4 (season of birth: winter, spring, summer, fall) x 4 (preschool: Head Start, state preschool, summer orientation camp, and no known preschool) ANOVA was conducted combining all four cohorts (N = 5,409). Significant main effects were found for season of birth (age), F = 68.46 (3, 5393), p < .000, $eta^2 = .037$ (small effect size), and preschool experience, F = 311.65 (3, 5393), p < .000, $eta^2 = .148$ (large effect size), with a nonsignificant interaction term, F = 1.37 (9, 5393), p = .194, $eta^2 = .002$. Post-hoc comparisons using Tukey's method found the following pattern of mean KSEP rating differences (see Figure 1) for season of birth: winter > spring > summer > fall. Post-hoc comparisons for preschool experience (see Figure 1) found this pattern: Head Start > state preschool > preK summer camp > kindergarten (no known formal preschool experience).

Figure 1. Mean kindergarten Student Entrance Profile ratings of kindergartners by preschool experience and age at K entry



Students Held Back (Redshirted) for One Year

As an additional analysis, we examined each cohort and identified all students whose birth date indicated that they entered kindergarten one year later than their same-age peers (these students were not included in the previous analyses). There were 108 students (1.5% of all students in the sample) whose enrollment in kindergarten was held back one year. This group was comprised of 55% boys, 45% girls, and 92% of them had no known formal preschool experience. The mean KSEP rating was 48.30 (SD = 10.22) compared to a mean rating of 48.55 (SD = 9.73) for all students who entered school at a typical age, t = 0.25 (N = 5506), p = n.s.. Only 27% of these children had KSEP ratings in the top 25% of all children, even though they were all older than the other students in their cohort at kindergarten entry.

Predicting Grade 2 Academic Achievement

Assessing school readiness is important for understanding the effects of kindergarten preschool articulation efforts; in addition, distal effects are also important, such as early scholastic achievement. To examine the relative effects of the variables examined in this study on academic achievement, two simultaneous logistic regressions were performed with the following binary predictor variables: season of birth, gender, KSEP, language of response, preschool experience, and KSEP rating. The dependent variables were Grade 2 California Standards Test Scores in English-Language Arts and Mathematics. Table 3 shows the model fit statistics for each logistic regression, which were acceptable.

Table 3 Summary of Logistic Regression Analysis Model for Predicting Grade 2 California Standards Test Scores in English-Language Arts and Mathematics (0 = Far Below Basic, Below Basic, Basic; 1 = Proficient, Advanced)

Predictor variables	В	SE B	Wald ^a	OR (95% CI)	р				
CST English–Language Arts									
Age at kindergarten entry	0.12	.15	0.72	1.13 (0.85–1.51)	.397				
Gender	0.35	.15	5.69	1.41 (1.06-1.88)	.017				
KSEP language of response	0.51	.15	11.95	1.67 (1.25–2.23)	.001				
Preschool experience	-0.20	.16	1.63	0.82 (0.60–1.16)	.202				
KSEP rating	1.51	.17	76.50	4.51 (3.22–6.32)	< .0001				
Constant	-2.42	.17	77.29		< .0001				
Cox Snell R^2 — Nagelkerke R^2 = .114–.157; Model fit = $\chi 2$ (5, N = 979) = 118.12, p < .0001, goodness of fit test—Homer and Lameshow Test = $\chi 2$ (8, N = 979) = 7.09, p = .528; classification accuracy = 71.1%									
CST Mathematics									
Age at kindergarten entry	0.30	.14	4.94	1.35 (1.04–1.76)	.026				
Gender	-0.07	.13	0.26	0.93 (0.72–1.21)	.608				
KSEP language of response	0.21	.14	2.33	1.24 (0.94–1.62)	.127				
Preschool experience	-0.33	.15	4.93	0.72 (0.54-0.96)	.723				
KSEP rating	1.30	.18	55.03	3.67 (2.60-5.18)	< .0001				
Constant	-0.43	.15	8.73		.003				
Cox Snell R^2 — Nagelkerke R^2 = .077–.102; Model fit = $\chi 2$ (5, N = 977) = 77.99, p < .0001; goodness of fit test—Homer and Lameshow Test = $\chi 2$ (8, N = 977) = 4.01, p = .934; classification accuracy = 60.7%									

^a degrees of freedom was 1 for each predictor variable.

The following results can be interpreted using Cohen's (1988) guidelines for odds ratio (OR) effect sizes: 1.49 = small, 3.45 = medium, and 9.00 = large. As shown in Table 3, proficient/advanced CST E-LA status was significantly predicted by gender (Wald chi-square = 5.69, OR = 1.41) and KSEP language of response (Wald chi-square = 1.95, OR = 1.67). The strongest predictor was KSEP rating (Wald chi-square = 76.50, OR = 4.51) – the odds of children with a 75-99 KSEP percentile rank being proficient/

advanced on the Grade 2 E-LA CST was 4.51 times greater than the odds of children with a 1-74 KSEP percentile rating having proficient/advanced status. Fifty-nine percent of the children with higher KSEP ratings had CST scores in the proficient/advanced range compared to 27% of children with lower KSEP scores. Age at kindergarten entry (Wald chi-square = 0.72, OR = 1.13) and preschool experience (Wald chi-square = 1.63, OR = 0.82) did not significantly predict E-LA CST status.

Grade 2 CST Mathematic status was also most strongly predicted by KSEP rating (Wald chi square = 55.03, OR = 3.67). This result indicates that the odds of children with KSEP ratings in the 75-99 percentile rank range being proficient or advanced on the Grade 2 E-LA CST was 3.67 times greater than the odds of children with KSEP ratings with 1-74 percentile ranks having proficient or advanced status. Sixty-nine percent of the children with higher KSEP ratings had CST mathematics scores in the proficient-advanced range compared to 43% of children with lower KSEP ratings. The only other variable to modestly predict Grade 2 CST Mathematics status was age at K entry (Wald chi square = 4.94, OR = 1.35). Gender, KSEP language response, and preschool experience were not significant predictors.

DISCUSSION

Overall, the results of this study indicated that age, and gender (significantly, but slightly) and preschool experience (significantly and moderately) were related to Hispanic children's school readiness upon entry into kindergarten. Specifically, children who had some form of preschool experience were rated significantly higher in terms of their school readiness than children with no preschool experience, which is consistent with previous research examining similar populations of children (Connell & Prinz, 2002; Lee et al., 1991; Loeb et al., 2007; Turney & Kao, 2009). Also, similar to previous research findings, older children were, on average, more ready at kindergarten entry than their younger peers (Meisels, 1996; Shepard & Smith, 1986) and girls were slightly more ready than boys. It should be noted that the youngest children in our sample with Head Start preschool experience were rated as more ready (M = 52.6) than the oldest children with no known preschool experience (M = 47.6). There was no significant interaction between age and preschool experience on school readiness, indicating that age did not moderate the effectiveness of preschool in preparing children for kindergarten entry. Thus, it appears that for Hispanic children from families experiencing low socioeconomic circumstances, preschool experience was more important to improving school readiness than chronological age alone.

Other research of the long-term achievement patterns of Hispanic students indicated that "...half of the achievement gap in fourth grade exists when students walk through the door in kindergarten" (Rumberger & Arellano, 2007, p. 71). The results of this study lend support to this assertion because school readiness at kindergarten entry was the most significant factor in predicting children's later academic success. The effects of age at kindergarten entry, gender, and preschool experience on later achievement were negligible, suggesting a critical transition at the time of kindergarten entry. In other words, it appears that preschool experience and age were important influences on whether these students were ready for school prior to entry into kindergarten; however, once these children entered the K-12 system, school readiness level was the primary factor that significantly predicted subsequent academic achievement.

Finally, our results do not support the practice of academic redshirting, or holding younger children back a year before enrolling them into kindergarten. This finding appears to contradict a study by Datar (2006) that indicated that delaying kindergarten entry for younger at-risk students significantly improved their test scores in both reading and math.

Issues Related to Age at School Entry

The findings of this study pertaining to the effects of age on educational "success" were based only on the student's Grade 2 CST scores. There is a need to extend the analysis to examine academic trajectories across elementary and into secondary school. Moreover, when assessing the influence of age at school entry, other outcomes can be legitimately considered. For example, Dhuey and Lipscomb (2008) found that older age at school entry is associated with higher rates of leadership in high school, which is associated with increased economic earnings. However, these relations are complex and not completely understood. Cascio and Schanzenbach (2007) reported that socioeconomic factors could interact with

age of school entry on distal outcomes such as leaving school early. These authors reported that youth from families experiencing low income who are older at school entry are less likely to take the Scholastic Aptitude Test. Dobkin and Ferreira (2010) also reported that younger children may have lower academic achievement, but as a group, they actually stayed in school longer than their older classmates. This is something to consider as California's kindergarten enrollment age moves to September 1. This will mean that children with September birthdates, for example, will be 18 years, 9 months old at their normal time for graduation from high school.

Issues Related to Effects of Preschool Experience

This study found that children attending preschool were more likely to have cognitive and socialemotional profiles indicative of being ready for school entry. Preschool accounted for about 15% of the variance in KSEP ratings, with age at school entry and gender accounting for substantially less variance. This finding is consistent with other studies showing that children attending center-based preschools, such as Head Start (all Head Start programs in this study were accredited by the National Association for the Education of Young Children), have significantly higher cognitive and social-emotional skills when entering kindergarten compared to a control sample of similar children (U.S. Department of Health and Human Services, Administration for Children and Families, 2010). Nonetheless, when it came to predicting Grade 2 CST scores, the positive effects of preschool experiences were no longer evident, a pattern that mirrors the findings of the Head Start Impact Study (U.S. Department of Health and Human Services, Administration for Children and Families, January 2010) and other studies (Magnuson, Ruhm, & Waldfogel, 2007). One interpretation of this finding is that preschool experiences on average help to improve the basic cognitive and social-emotional skill sets that children need to enter school ready to learn and to be responsive to high-quality instruction. However, children who have not had preschool experiences may nonetheless have had sufficient care and nurturing during the preschool years to have the requisite cognitive and social-emotional skills at school entry. The possibility of a child having nurturing childcare outside of a preschool setting indicates that the variance in later academic skills, such as at Grade 2 in this study, will be more strongly related to school readiness, and not preschool participation per se. What appears to be important is that children get ready for school, whether it is in a formal preschool or in another nurturing child rearing context.

Alternatively, it should be considered that the sample in the present study was predominately Hispanic and many of the youths were from families with low-income circumstances. These children typically have less access to center-based preschools (Turney & Kao, 2009), which diminishes their relative odds of being ready for school. Other factors need to be considered. For example, in a study using the Early Childhood Longitudinal Study dataset, Loeb et al. (2007) found that other variables should be considered for Hispanic children. In particular, length and intensity of the preschool experience was associated with higher reading and math achievement. We were unable to control for this in the present study, which could have accounted for the diminished effects of preschool on academic achievement.

STUDY LIMITATIONS AND NEED FOR FUTURE RESEARCH

The results of this study generalize only to Hispanic children in California and contribute to the literature by increasing knowledge about their early educational needs. Nonetheless, there is a need to use the KSEP in other schools and communities to further assess its predictive ability. Another limitation is that we were limited to variables that were archived by the district and were available for analysis; hence, we could not examine the influence of other factors on school readiness and later school achievement, such as parental involvement and child rearing practices. Although preschool experience was a robust predictor of school readiness, there was unexplained variance. Future research is needed to examine other key factors that influence the school readiness of Hispanic children.

CONCLUSION AND IMPLICATIONS FOR PRACTICE AND POLICY

An easy and practical step that school psychologists can take to help all children have the best opportunity to be ready for school at entry to kindergarten is to open lines of communication between their school district and their state and regional programs that serve preschool children and their families. Major coordinated early childhood development initiatives can be reviewed, for example, in California (First 5, http://www.first5california.com/default.asp), North Carolina (Smart Start, http://www.smart-start-nc.org/), and Colorado (http://smartstartcolorado.org/). In addition, many communities have Head Start programs that can be a focus of efforts to facilitate the school readiness of children with high needs. Among the ways that school psychologists can support efforts to promote school readiness are to: (a) become informed about their community's 0-5 programs and services; (b) discuss ways to articulate services and information from the preschool years through the transition to kindergarten (for example, opening a district cumulative folder for children in the last year of preschool); (c) disseminate information about how parents can support their children's preparation for school by accessing resources such as the Public Broadcasting Services' *A Place of Our Own* (http://aplaceofourown.org) and *Los Niños en Su Casa* (http://www.losninosensucasa.org/index.php); and (d) implement a universal school readiness assessment process that links with the district's instructional support services.

The results of this study lend support to the argument that merely moving to an earlier kindergarten enrollment date may not substantially affect the educational trajectories of Hispanic children from families experiencing low-income circumstances. The results do lend support to efforts to provide high-quality preschool experiences, such as in nationally accredited Head Start preschools, because this was the strongest predictor of school readiness. School psychologists should become aware of their districts' plans to implement these services because merely being "redshirted" for a year was not associated with school readiness or accelerated achievement in the early school years. Finally, the strong relation between school readiness and Grade 2 CST scores emphasizes the need to enhance preschool opportunities in all communities and to facilitate the transition of children into high-quality kindergarten programs.

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